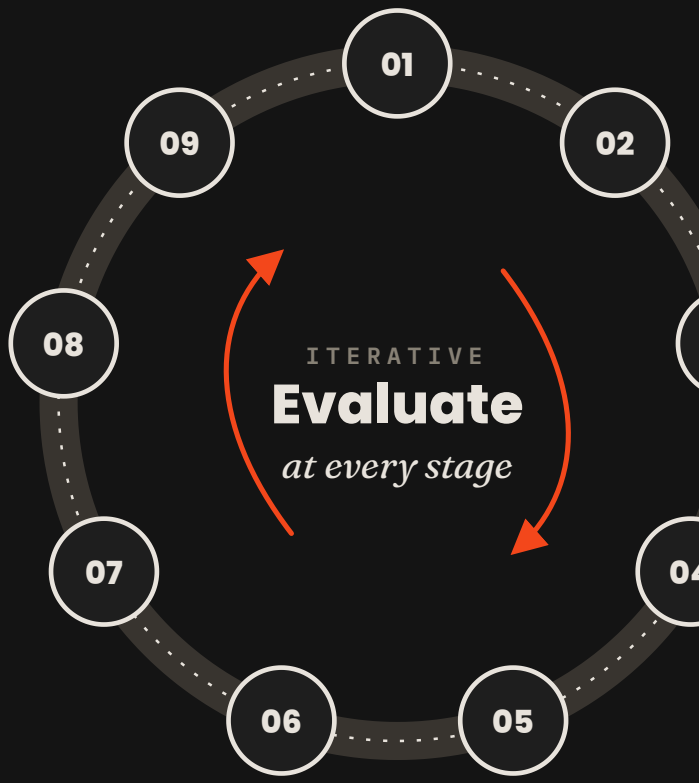


SECTION 01 · DESIGN

The Design Process.

Course notes for every part of the Design area of N5 Design & Manufacture — from reading a brief to evaluating a proposal. Written for the question paper and the design assignment.

Course notes

01 The design process & the brief

02 Research & the specification

03 Generating ideas

04 Function & performance

05 Market & aesthetics

06 Ergonomics & anthropometrics

07 Modelling & graphics

08 Evaluation & refining

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design | engineering | technology

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Contents.

01 The design process & the brief p.04

02 Research & the specification p.10

03 Generating ideas p.17

04 Function & performance p.23

05 Market & aesthetics p.29

06 Ergonomics & anthropometrics p.36

07 Modelling & graphics p.42

08 Evaluation & refining p.49

\+ The design assignment at a glance · Glossary p.55

HOW TO USE THESE NOTES

EXAM FOCUS — What the marking instructions reward — and the answers that score **0 marks**. Taken from real N5 marking instructions.

ASSIGNMENT — How the topic links to the 55-mark design assignment and its marking bands.

KEY TERMS — Words you need to use accurately. Highlighted like **this** in the text.

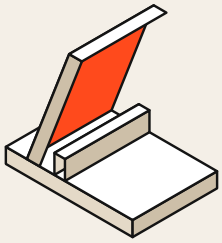
QUICK CHECK — Short questions to test yourself. Answers are in the notes.

QUESTIONS — Every topic ends with activities, exam-style questions and a self-check. Write in the spaces — or use the type-in version on screen.

RUNNING CASE STUDY

DOCK — a bedside phone stand

One product follows you through all eight topics so you can see each stage of the design process in action: the brief, the research, the specification, the ideas, the models, the drawings and the evaluation.



How you are assessed.

The course is marked out of 180. Design knowledge earns marks in the exam and drives most of your 55-mark design assignment.

QUESTION PAPER
80
1 hour 45 minutes. Section 1 (60 marks) · Section 2 (20 marks). About **30 marks** of Section 1 test the Design topics in this booklet.

ASSIGNMENT — DESIGN
55
Set and marked externally. Up to seven A3 sheets, including the research and planning for manufacture pro formas.

ASSIGNMENT — PRACTICAL
45
You make the proposal you designed. A very simple proposal limits the practical marks you can reach.

A The design assignment

DESIGN ASSIGNMENT SKILL	MARKS
Analysing a brief (research 5 + specification 3)	8
Generating ideas	9
Developing ideas (explore 6 · refine 6 · design K&U 4 · materials & manufacture K&U 4)	20
Using models	6
Using graphics	6
Planning for manufacture	6
Total	**55**

B Command words

COMMAND WORD	WHAT THE MARKER WANTS
Name / State	A short answer. One word can be enough. Only the first answers up to the number of marks are marked.
Outline	"More than naming, but not a detailed description." One valid, qualified point per mark.
Describe	"A statement or structure of characteristics and/or features … more than an outline or a list." One point per mark.
Explain	"Relate cause and effect and/or make relationships between things clear." Say *why* — use "because…" or "so that…".

EXAM FOCUS

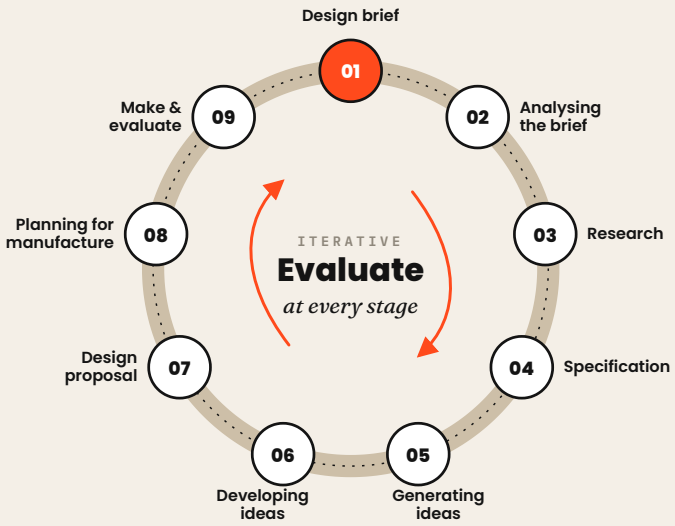
Unqualified answers score zero

The course reports have repeated it each year since 2023: "unqualified responses such as 'quick', 'easy', and 'cheap', are not awarded marks for most questions." Always finish the thought — quick *to do what*? Easy *for whom*? Cheaper *than what*?

0 MARKS *"Questionnaires are quick."*

1 MARK *"You can get opinions from lots of people and they are easy to collate."*

01



TOPIC 01 · DESIGN

The design process & the brief.

Every product starts as a problem. The design process is how a designer turns that problem into something that can be made — testing and improving it all the way.

IN THIS TOPIC

01 The stages of the design process
02 Why the process is iterative
03 Who influences a design
04 The design brief
05 Analysing a brief

I CAN…

- ☐ describe the main stages of the design process
- ☐ explain what "iterative" means and give an example
- ☐ name people who influence a design and their roles
- ☐ pick out the key requirements in a design brief
- ☐ turn a brief into questions to research

COURSE SPECIFICATION

ANALYSING A BRIEF carry out research; incorporate findings into a specification

K&U the role of the product specification in the design process

ASSIGNMENT analysing a brief — 8 marks

IN THE EXAM

The design process is the context for every Design question — "during the design process", "at the initial ideas stage". Roles of people who influence design have been asked as a 3-mark table (2024).

IN THE ASSIGNMENT

Analysing a brief is worth **8 marks**: research (5) and specification (3). Every later stage is judged against your brief and specification.

Brief | Research | Spec | Ideas | Develop | Models | Graphics | Plan | Evaluate

1.1 What is the design process?

The **design process** is the series of stages a designer works through to turn a problem into a product that can be manufactured. It starts with a **design brief** and ends with a **design proposal** — a fully worked-out design with enough detail to be made.

The stages are usually shown in order, but real designing is never a straight line. At every stage the designer evaluates their work and, if something isn't right, goes back to an earlier stage. This makes the design process **iterative**.

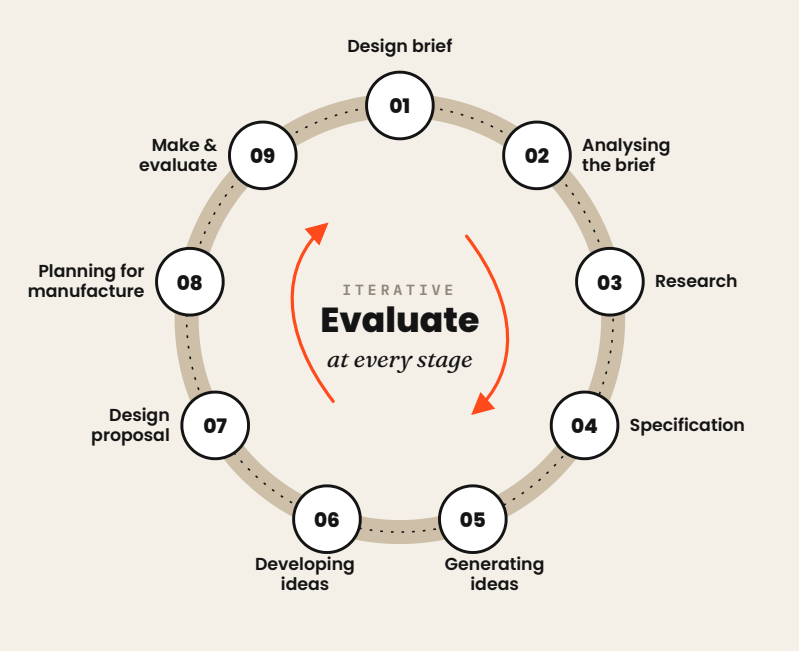


Fig. 1.1 The design process is a loop, not a line. Evaluation happens at every stage — not just at the end.

1.2 Iteration in action

The DOCK design team made a card model of an early idea. They found the phone tipped backwards, so they went back to **developing ideas** and made the base deeper. A questionnaire later showed users wanted to charge the phone in the stand, so a cable slot was added to the **specification**. Each loop improves the design.

KEY TERMS

Design brief
A short statement of the problem or need. It says what is to be designed — not what the answer looks like.

Specification
A detailed list of what the product must do or be, built from the brief and research.

Iterative
Repeating stages — evaluating, changing and testing again — to improve a design.

Design proposal
The final, refined design with enough detail to be manufactured.

Prototype
A working, full-size version made to test the proposal.

QUICK CHECK

01 What does "iterative" mean?

02 Give one example of a designer going back a stage.

03 What is the difference between a brief and a specification?

Brief | Research | Spec | Ideas | Develop | Models | Graphics | Plan | Evaluate

1.4 The design brief

A **design brief** is a short statement — often from a **client** — that describes a problem or need. It sets out what is to be designed, who it is for and a few key requirements, often written as "must" statements. A good brief does **not** describe the solution: that is the designer's job.

DESIGN BRIEF · CASE STUDY

A company that makes bedroom accessories wants to launch a **stand for a mobile phone** to be used **beside a bed**. The stand **must** hold the phone so the **screen can be seen from the bed**, **must** allow the phone to be **charged while it is in the stand**, and **must** suit the style of a **teenager's bedroom**.

which phones? what angle? what style?

A BRIEF USUALLY TELLS YOU

- the type of product
- the target user or market
- where or how it will be used
- a few essential requirements ("must…")
- sometimes a theme or style to follow

IT DOES NOT TELL YOU

- what it should look like
- which materials to use
- exact sizes — you find these through research

1.5 Analysing a brief

Analysing a brief means breaking it down to find out exactly what is needed and what you still need to find out. Read it several times, highlight the key words and every "must", then ask questions. Each question points to an area you need to **research** — and each research finding can become a **specification point**.

ASK…	ABOUT DOCK	THIS LEADS TO RESEARCH INTO…
Who will use it?	Teenagers, at night and in the morning	target market, aesthetics, ergonomics
What must it do?	Hold a phone; allow charging	function, phone sizes, cable types
Where is it used?	On a bedside table, in low light	size limits, stability, safety
When / how often?	Every day, phone added and removed	performance, durability, maintenance
Why is it needed?	Phones get knocked off or lost in bed	existing products, user problems
How much?	Selling price, size, materials	cost, materials, manufacture

DESIGN ASSIGNMENT | ANALYSING A BRIEF | 8 MARKS

This skill is marked on your **research** (5 marks) and your **specification** (3 marks). The brief contains key information you should include in your specification — but "specification points that are drawn only from the brief will achieve a maximum of 1 mark." You need research to go further.

EXAM FOCUS

Analyse, don't copy

Research and specification points must be specific to *this* product. Generic statements and points copied from the brief earn little or nothing.

0 MARKS *"It must look good."*

MAX 1 *"A specification made only of points from the brief."*

1.6 From brief to research: a worked example



Fig. 1.2 One key phrase from the brief becomes a research task.



Fig. 1.3 Theme and style requirements need research too — not your own opinion.

1.7 Who influences a design?

WHO	THEIR ROLE IN A DESIGN
Client	Identifies the need, sets the brief and usually pays for the project.
Designer	Generates and develops ideas that meet the brief and specification.
Marketing team	Researches the market to identify the needs and wants of potential consumers.
Engineer / manufacturer	Selects suitable materials, joining methods, processes and finishes — and makes it.
Accountant	Manages the budget for the project.
Retailer	Sells (and often advertises) the product.
Consumer / user	Uses their money to buy the product, then uses it.

Products are rarely designed by one person. A **design team** brings together different experts. In 2024 the N5 exam asked candidates to complete a table of people who influence design and their roles.

WHAT SCORES

Roles

1 MARK *"The accountant is in charge of the money."*

1 MARK *"The engineer selects suitable materials for manufacture."*

TOPIC IN 30 SECONDS

- The design process takes a brief to a proposal that can be manufactured.
- It is **iterative**: evaluate at every stage and loop back to improve.
- A brief states the problem, not the solution.
- Analysing a brief = key words → questions → areas to research.

QUICK CHECK

01 Name three people who influence a design and give the role of each.

02 Write two questions you would ask about the DOCK brief.

03 Why can't a specification be written from the brief alone?

01 Questions & activities.

TOPIC 01 · PROCESS & BRIEF

ACTIVITY 1.1 Iteration spotter

In each story the designer goes back to an earlier stage. Name the stage they return to and say why.

STORY	STAGE RETURNED TO	WHY?
A card model shows the handle is too small to grip.		
Pupils surveyed want the product in school colours.		
A test prototype tips over when loaded.		
The client changes the budget halfway through.		
The chosen joint cannot be cut with school tools.		

ACTIVITY 1.2 Analyse a brief

PRACTICE BRIEF

A seaside café wants a holder for menus and condiments for its outdoor tables. The holder must hold at least four different items, must stay in place in windy weather, and must suit the café's seaside style.

(a) List the key requirements in the brief.

(b) Write one research question for each.

Who?

What?

Where?

How much?

(c) Which of the requirements will need the most research? Explain your choice.

EXAM PRACTICE

Exam-style questions

8 MARKS

1 A design team is developing a new garden bench.

(a) Describe the role of each of the following people in the design of the bench: **(i)** client **(ii)** engineer **(iii)** retailer. **3**

(b) Describe what is meant by a design brief. **1**

(c) State **two** pieces of information a design brief would normally include. **2**

(d) Explain why a designer analyses a brief before carrying out research. **2**

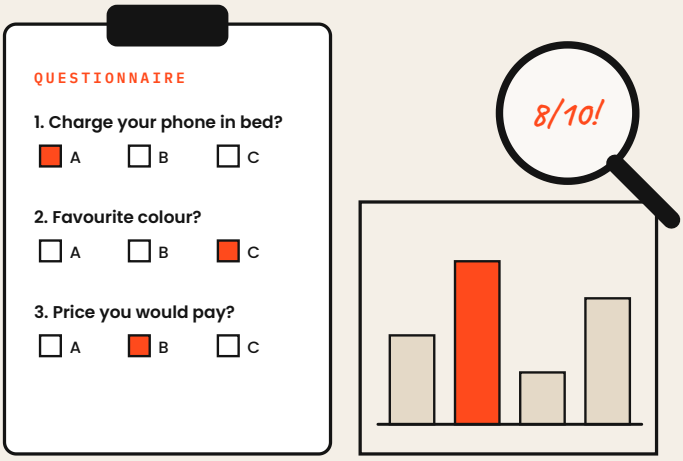
CHECK YOURSELF

How confident am I?

TICK OR TYPE X

SUCCESS CRITERIA	NOT YET	NEARLY	GOT IT
I can describe the main stages of the design process			
I can explain what "iterative" means and give an example			
I can name people who influence a design and their roles			
I can pick out the key requirements in a design brief			
I can turn a brief into questions to research			

02



TOPIC 02 · DESIGN

Research & the specification.

Good research turns guesses into facts. The specification turns those facts into a checklist the whole design must meet.

IN THIS TOPIC

01 Gathering data — primary and secondary

02 Choosing research techniques

03 Questionnaires: key stages and benefits

04 User trips (not user trials!)

05 Writing the product specification

I CAN…

- ☐ choose a research technique to suit the information I need
- ☐ describe the key stages of a questionnaire
- ☐ outline the key stages of a user trip
- ☐ explain why a specification is used
- ☐ write specific specification points from research

COURSE SPECIFICATION

ANALYSING A BRIEF gathering data

K&U key stages of questionnaires and user trips

K&U reasons for the selection of research techniques

K&U the role of the product specification

IN THE EXAM

Usually the first Design question: key stages of a questionnaire or user trip (3 marks), benefits of questionnaires (3), naming another research technique (1), why a specification is used (1).

IN THE ASSIGNMENT

Research (5 marks) on the double-sided research pro forma and **specification (3 marks)**. Opinion-based research and points taken only from the brief score little.

Brief | Research | Spec | Ideas | Develop | Models | Graphics | Plan | Evaluate

2.1 Gathering data

Research is how designers find the facts they need to design for real people. Research can be **primary** — information you collect yourself, such as a questionnaire or a user trip — or **secondary** — information someone else has already collected, such as anthropometric tables, books, reviews or websites.

Research must be **aimed at the brief**. Every piece of research should find out something you can use, ideally something that becomes a **specification point**.

EXAM FOCUS

Know which is which

In 2025, when asked for an alternative *research* technique, many candidates wrote an *idea generation* technique — scoring 0. Brainstorming and SCAMPER are **not** research.

2.2 Choosing a research technique

There is no single "best" technique. Designers choose a technique because it suits the information they need — the course specification calls these the **reasons for selection**.

TECHNIQUE	WHAT IT TELLS YOU	CHOOSE IT WHEN…
Questionnaire	Opinions and preferences from lots of people	you need the views of your target market (colour, price, features)
User trip	First-hand experience of using a product	you need to understand how an existing product works, feels and is stored
User trial	How other people use a product, observed and recorded	you need to see real users interact with a product or model
Product analysis / comparison	Strengths and weaknesses of existing products	you need to know what is already on the market and how it is made
Measuring & anthropometric data	Sizes of objects and people	you need sizes — e.g. phone widths, hand sizes
Interview / focus group	Detailed views from a few people	you need in-depth answers, e.g. from a client or expert
Testing	Measured performance (strength, stability, time)	you need hard evidence about how well something performs

WHAT SCORES

Name an alternative research technique

- 1 MARK — *"User trip."*
- 1 MARK — *"Product comparison."*
- 0 MARKS — *"Survey. (too similar to questionnaire)"*
- 0 MARKS — *"Market research."*
- 0 MARKS — *"Use the internet. (unqualified)"*

DESIGN ASSIGNMENT | ANALYSING A BRIEF

RESEARCH · 5 MARKS

Top band: "effective range of appropriate issues researched" and "effective use of research techniques." Remember:

- "Research that generates generic information is not valid."
- "Research techniques must be appropriate to the information being gathered."
- Your own opinion is not research. Theme images must be analysed for specific colours, shapes or imagery.

Brief | **Research** | Spec | Ideas | Develop | Models | Graphics | Plan | Evaluate

2.3 Questionnaires

A **questionnaire** is a set of questions given to a group of people — ideally your target market — to gather opinions and information. Questions can be **closed** (tick a box, choose from a list), **rating** (score 1–5) or **open** (write an answer). Closed and rating questions are faster to collate into graphs.

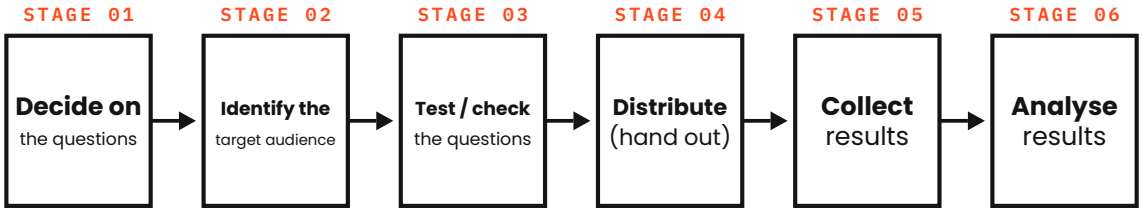


Fig. 2.1 Key stages of a questionnaire. Describe three for 3 marks.

Benefits of questionnaires

- gather opinions from a **wide range of people**
- can be **written to suit the target market**
- specific questions can be asked, e.g. about aesthetics, ergonomics or function
- can be completed face to face, on paper or online — and **anonymously**
- a rating system helps refine choices
- results are easy to present as **graphs and charts**
- findings can be used to **inform a specification**

WHAT SCORES

Describe the key stages of a questionnaire

2 MARKS *"Hand out the questionnaire to the target audience."*

1 MARK *"Don't make it too long as people may get bored."*

0 MARKS *"Questions, people, results. (a list)"*

0 MARKS *"They are quick to do."*

2.4 User trips

On a **user trip** the **designer uses the product themselves**, step by step, to experience it as a user would — setting it up, using it, putting it away — and records what they find. It gives first-hand information about ease of use, comfort, how it works and what could be improved.

STAGE	WHAT HAPPENS
1 Set up	Decide what you want to find out. Unpack, assemble or configure the product; read the instructions.
2 Undertake	Use the product in all its normal conditions, step by step: ergonomics, performance, cleaning, storing.
3 Put away	Fold, pack down or store it. Consider maintenance and how easy it would be to dispose of.
4 Collate	Record your findings and analyse them — ready to use in a specification.

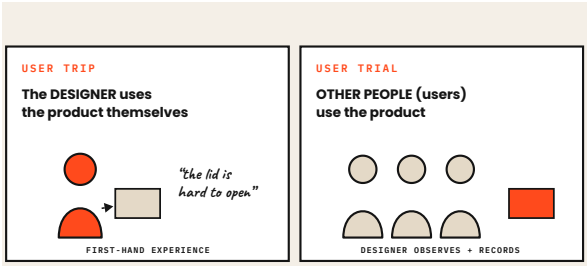


Fig. 2.2 Trip = you use it. Trial = others use it while you observe.

EXAM FOCUS

Trip ≠ trial

2026 course report: "Many candidates referred to a user trial rather than a user trip and did not gain marks." Handing the product out to others is a **trial**.

0 MARKS *"Hand out the item to the target audience."*

1 MARK *"Use the item for a period of time."*

What a user trip can tell you

When a question shows a product and asks what a user trip could find out, every answer must refer to **a specific part of that product**.

WHAT SCORES

Office chair — information from a user trip

1 MARK	*"Is it easy to understand how the levers work?"*
2 MARKS	*"If it is easy to move on a carpet, and if the seat is comfortable for long-term use."*
0 MARKS	*"How strong it is."*
0 MARKS	*"How much it costs."*

Secondary research

Secondary sources save time and give data you could not collect yourself: **anthropometric tables** (body sizes), **product reviews**, catalogues of sizes (phones, A4 paper, stock materials), standards and trends. Say *what* you would look up and *why* — "use the internet" on its own scores nothing.

DOCK RESEARCH PLAN

- **Measure** 10 popular phones → width and thickness range
- **Questionnaire** 20 teenagers → colour and material preferences
- **User trip** with a card model in bed → best viewing angle
- **Product analysis** of 3 existing stands → prices, faults, stability

2.5 The product specification

The **product specification** is a detailed list of everything the product must do and be. It is written after the research, using information from the **brief** and the **research findings**.

Why is a specification used?

- It gives a clear idea of what the product should be.
- It guides the designer while exploring and refining ideas.
- The designer is less likely to forget important features.
- It is an **ongoing evaluation tool** — every idea and the final proposal can be checked against it.

WHAT SCORES

Explain why a specification is used

1 MARK	*"As a checklist for your design."*
1 MARK	*"To evaluate how well an initial idea meets the requirements of the brief."*
0 MARKS	*"As a starting point."*
0 MARKS	*"A list of what the product needs. (a definition)"*



Fig. 2.3 Every specification point should be traceable back to a research finding.

2.6 Writing strong specification points

A specification point should be **specific** and, where possible, **measurable**, so that you can later check whether a design meets it. Group points under design factors — function, ergonomics, aesthetics, market, performance, safety, materials and manufacture — so nothing is forgotten.

WEAK POINT	WHY IT'S WEAK	STRONG POINT
It must look nice.	Opinion — can't be checked	Must use matt black and one accent colour, chosen by 14 of 20 teenagers surveyed.
It must hold a phone.	Taken straight from the brief	Must hold phones up to 80 mm wide and 13 mm thick.
It must be stable.	Not measurable	Must not tip when a 220 g phone is tapped at the top of the screen.
It must be a good size.	Vague	Footprint must be no larger than 130 × 90 mm to fit on a bedside table.
I want it to be red.	Personal opinion	Colours must suit the theme identified from the mood board analysis (warm orange, white).

DOCK SPECIFICATION · EXTRACT

Function — holds phones up to 80 × 13 mm; cable slot ≥ 12 mm wide

Ergonomics — screen angle 60–70°; phone removed with one hand

Aesthetics — matt finish, one accent colour from survey

Market — teenagers; retail price under £15

Performance — does not tip when screen is tapped

Safety — no sharp edges or corners

DESIGN ASSIGNMENT

ANALYSING A BRIEF

SPECIFICATION · 3 MARKS

MARKS	BAND
1	limited — "contains only points taken from the brief"
2	adequate points gained from research
3	detailed — "a range of points gained from research"

"Specification points that are based purely on the candidate's personal opinion should not be awarded marks." A detailed specification also gives you things to **refine** later on.

QUICK CHECK

01 State one difference between a user trip and a user trial.

02 Give two reasons a specification is used.

03 Rewrite "it must be comfortable" as a strong specification point for a chair.

TOPIC IN 30 SECONDS

- Choose research techniques that suit the information you need.
- Questionnaire stages: questions → audience → test → distribute → collect → analyse.
- User trip = the designer uses it (set up, undertake, put away, collate). User trial = others use it.
- The specification guides design and is an ongoing evaluation tool.
- Strong spec points are specific, measurable and come from research.

EXAM FOCUS

Explain, don't define

"Definitions of a specification score 0 marks." When asked *how* or *why* it is used, say what the designer **does** with it during the design process.

1 MARK *"To check all requirements of the specification are met by the end of the design process."*

02 Questions & activities.

TOPIC 02 · RESEARCH & SPEC

ACTIVITY 2.1 Write a questionnaire

PRACTICE BRIEF · FROM TOPIC 01

A seaside café wants a holder for menus and condiments for its outdoor tables. The holder must hold at least four different items, must stay in place in windy weather, and must suit the café's seaside style.

Write four questions for café customers: one **closed**, one **rating** (1–5), one **multiple-choice** and one **open**.

CLOSED

RATING 1–5

MULTIPLE CHOICE

OPEN

Who will you give it to, and how many people? Why?

ACTIVITY 2.2 Plan a user trip

Plan a user trip on a product you own (for example a lunch box, pencil case or umbrella). Product: _____

STAGE	WHAT I WILL DO	WHAT I WILL RECORD
Set up		
Undertake		
Put away		
Collate		

ACTIVITY 2.3 Research to specification

Research findings

- Ketchup and sauce bottles measured: 52–68 mm diameter, 150–210 mm tall
- 12 of 20 customers chose blue and white
- Wind speed on the seafront often reaches 30 mph
- Menus are A5 card (148 × 210 mm)

Write four specific specification points.

EXAM PRACTICE

Exam-style questions

8 MARKS

1 Designers use a range of research techniques.

(a) Name **two** research techniques, other than a questionnaire, that a designer could use. **2**

(b) Explain why a designer would use a user trip, rather than a questionnaire, to find out how easy a camping stove is to set up. **2**

(c) Explain the difference between primary and secondary research. **2**

(d) Describe how a specification is used later in the design process. **2**

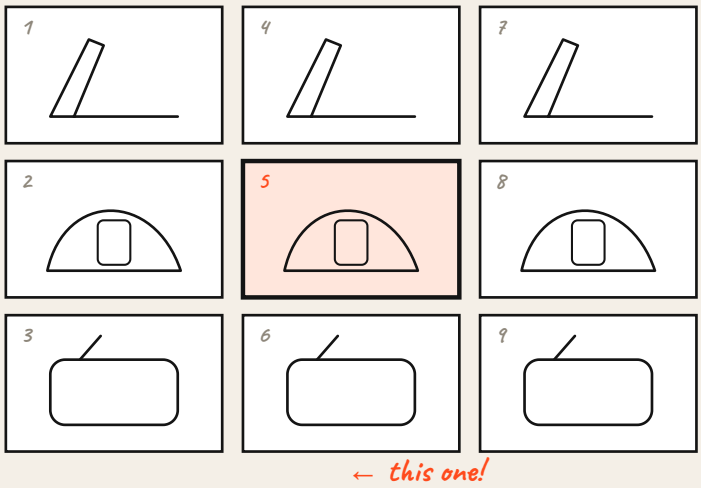
CHECK YOURSELF

How confident am I?

TICK OR TYPE X

SUCCESS CRITERIA	NOT YET	NEARLY	GOT IT
I can choose a research technique to suit the information I need			
I can describe the key stages of a questionnaire			
I can outline the key stages of a user trip			
I can explain why a specification is used			
I can write specific specification points from research			

03



TOPIC 03 · DESIGN

Generating ideas.

Your first idea is rarely your best. Idea generation techniques push you past the obvious so you can produce a wide range of creative, different ideas.

IN THIS TOPIC

01 What idea generation is — and isn't

02 Brainstorming

03 Morphological analysis

04 Other techniques: SCAMPER, mood boards, analogy and more

05 Generating ideas in the assignment

I CAN…

- ☐ describe the key stages of brainstorming
- ☐ outline the key stages of morphological analysis
- ☐ name and describe other idea generation techniques
- ☐ tell an idea generation technique from a research technique
- ☐ generate a range of different ideas aimed at a specification

COURSE SPECIFICATION

GENERATING IDEAS	generate ideas
K&U	appropriate use of idea-generation techniques
K&U	the key stages of morphological analysis and brainstorming
ASSIGNMENT	generating ideas — 9 marks

IN THE EXAM

Brainstorming or morphological analysis stages (3 marks) appear most years, plus naming another idea generation technique (1). In 2026 "many candidates appeared to be unfamiliar" with morphological analysis.

IN THE ASSIGNMENT

Generating ideas — 9 marks: a range of creative ideas that are clearly aimed at the specification and clearly different from each other.

3.1 What is idea generation?

Idea generation techniques are structured ways of producing lots of ideas quickly. They stop designers getting stuck on their first idea and help them find creative, original solutions. Designers choose a technique that suits the problem: brainstorming works well in a group; morphological analysis is good when a product has lots of parts or features that could be combined.

Ideas at this stage can be **rough**. The aim is quantity and variety — you will develop the best ones later.

RESEARCH TECHNIQUES (FIND FACTS)	IDEA GENERATION TECHNIQUES (CREATE IDEAS)
Questionnaire	Brainstorming
User trip / user trial	Morphological analysis
Product analysis / comparison	SCAMPER
Measuring, anthropometric data	Mood board / lifestyle board
Interview, focus group, testing	Technology transfer · analogy · lateral thinking

EXAM FOCUS

Not an idea generation technique

Marking instructions give **0 marks** for these when asked to name an idea generation technique:

- **Mind map** — "it is an organisational tool used during the analysis stage"
- **Existing products** — that is research
- Any research technique (questionnaire, user trip…)

3.2 Brainstorming

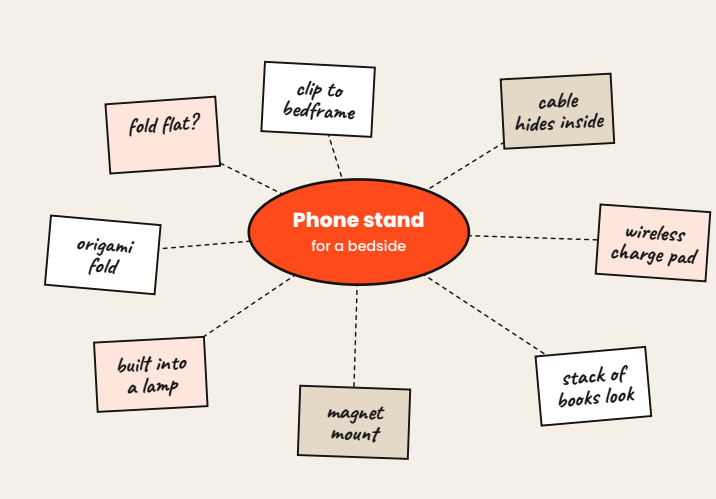


Fig. 3.1 A brainstorm for DOCK. Every idea is written down — none is too silly.

Brainstorming is a **group** activity for producing a large number of ideas in a short time.

Key stages

01 Communicate the purpose — share the problem or topic with the group.

02 Set a time limit and come up with as many ideas as possible.

03 Record every idea — no idea is too silly.

04 Spark ideas off each other's suggestions.

05 Select the most promising ideas to develop.

WHAT SCORES

Describe the key stages of brainstorming (3 marks)

2 MARKS *"People shout out lots of ideas and someone writes them down."*

1 MARK *"People think of lots of ideas. (refers to a group)"*

0 MARKS *"Think of lots of ideas. (too vague)"*

3.3 Morphological analysis

Morphological analysis breaks a product into its **parameters** — features or aspects that can be changed, such as material, shape or method of joining — and lists different options (**attributes**) for each. Choosing one attribute from each column, often at random, creates combinations you might never have thought of.

MATERIAL	MOUNTING	SHAPE OF BACK	CHARGING	EXTRA FEATURE
Birch plywood	Free-standing	Flat	Cable through base	Folds flat
Acrylic	Clips to bed frame	**Curved**	Cable slot in back	Storage tray
Oak	**Magnet mount**	Angled steps	**Wireless pad**	Night light
Aluminium	Wall bracket	Cut-out pattern	No charging	**Alarm clock**

Fig. 3.2 A morphological analysis table for DOCK. Parameters are the column headings; one attribute is chosen from each column.

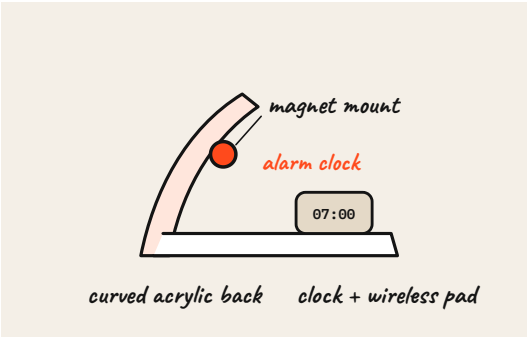


Fig. 3.3 The random combination becomes an idea sketch.

Key stages

01 **Identify a set of suitable parameters** for the table headings (e.g. material, shape, colour, mounting).

02 **Populate the rows** with suitable attributes for each parameter.

03 **Choose a combination** of attributes — often randomly, one from each column.

04 **Generate ideas** from the results by sketching each combination.

WHAT SCORES

Outline the key stages of morphological analysis

A labelled sketch of a table showing the stages can also earn all 3 marks.

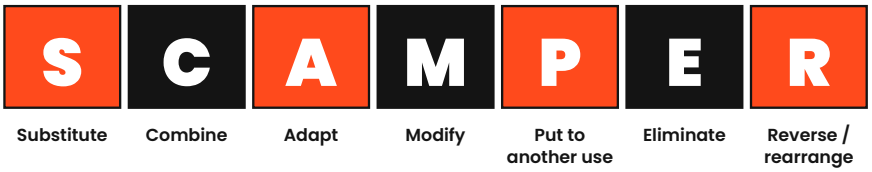
3 MARKS *"The designer makes a table with columns relating to different aspects affecting the design, they list options in each column, randomly select one option from each column and sketch an idea that includes the selections."*

EXAM FOCUS

The most unfamiliar process in 2026

"Many candidates appeared to be unfamiliar with this process and struggled to gain marks." Learn the four stages in order: **parameters** → **attributes** → **combine** → **generate ideas**. In 2024 candidates were shown a table and asked to name the technique — answer: morphological analysis.

3.4 SCAMPER



SCAMPER is a checklist for changing an idea. Course reports note candidates also use it to **explore** ideas during development.

Fig. 3.4 Seven ways to change an existing idea.

3.5 Other idea generation techniques

VISUAL

Mood board

A collage of images, colours, textures and words that capture a theme or feeling. It only helps if you **analyse** it — pick out specific colours, shapes or imagery to use.

VISUAL

Lifestyle board

Images showing the life, interests and possessions of the target user. Helps you design for that person.

BORROW

Technology transfer

Taking a technology or mechanism from one product and using it in another — e.g. a magnetic phone mount from a car dashboard.

BORROW

Analogy / biomimicry

Using something that works in another situation, often in nature. Burrs that stick to fur inspired hook-and-loop fasteners.

THINK

Lateral thinking

Deliberately looking at the problem in an unusual way — reversing it, exaggerating it or removing a "rule".

DRAW

Take your pencil for a walk

Doodle freely and let shapes suggest ideas. Good for breaking a mental block.

3.6 Generating ideas in the assignment

MARKS	BAND DESCRIPTORS (GENERATING IDEAS)
1–3	limited skill · ideas often not aimed at the specification · limited range · little creativity · few differences between them
4–6	adequate skill · ideas generally aimed at the specification · adequate range · adequate creativity · some differences
7–9	effective skill · ideas clearly aimed at the specification · effective range · show creativity · clear differences between them

- "Ideas that are copies of existing products will not allow candidates to achieve marks above the bottom band."
- "Basic shapes with no clear function will not attract marks."
- Annotations "should not simply describe what is already evident in a sketch or model" — add information instead.
- Ideas can be sketches **or photographs of sketch models**, and can appear throughout your folio.

DESIGN ASSIGNMENT GENERATING IDEAS

9 MARKS

Aim for lots of ideas, quickly. Make them **genuinely different** — not the same shape with a different colour — and point each one at your specification.

Note: the 2024 course report says "No marks are awarded for the use of idea generation techniques" on the research pro forma. Use them to *generate ideas*, not as research.

TOPIC IN 30 SECONDS

- Idea generation creates ideas; research finds facts.
- Brainstorming: group, time limit, record all, no idea too silly, build on others, select.
- Morphological analysis: parameters → attributes → combine → generate ideas.
- Mind maps and "existing products" are not idea generation techniques.

03 Questions & activities.

TOPIC 03 · GENERATING IDEAS

ACTIVITY 3.1 Morphological analysis — café holder

Add three attributes for each parameter. Roll a dice (or pick at random) to choose one from each column, then sketch the idea.

MATERIAL	STAYING PUT IN WIND	OVERALL SHAPE	SEASIDE FEATURE

ACTIVITY 3.2 Thumbnails — quantity first

Sketch six **clearly different** thumbnail ideas for the café holder in five minutes. Circle the most promising.

EXAM PRACTICE

Exam-style questions

8 MARKS

1 Idea generation techniques help designers produce creative ideas.

(a) Explain why a designer may choose morphological analysis rather than brainstorming. **2**

(b) Describe how SCAMPER could be used to develop an existing product. **2**

(c) Name **two** idea generation techniques that use collections of images. **2**

(d) State why 'looking at existing products' is not an idea generation technique. **1**

(e) Describe one benefit of generating a large number of ideas. **1**

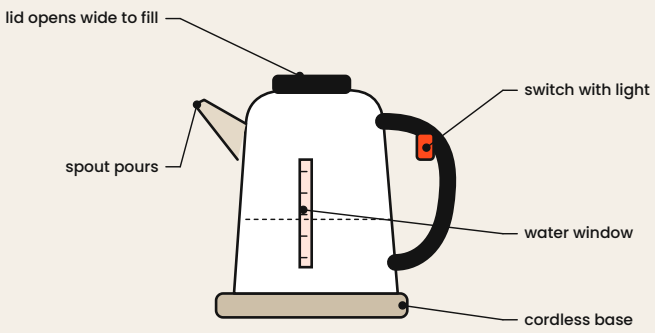
CHECK YOURSELF

How confident am I?

TICK OR TYPE X

SUCCESS CRITERIA	NOT YET	NEARLY	GOT IT
I can describe the key stages of brainstorming			
I can outline the key stages of morphological analysis			
I can name and describe other idea generation techniques			
I can tell an idea generation technique from a research technique			
I can generate a range of different ideas aimed at a specification			

04



TOPIC 04 · DESIGN

Function & performance.

What does a product do, how well does it do it, and how long will it keep doing it safely? These design factors shape almost every part of a product.

IN THIS TOPIC

01 Primary and secondary function

02 Performance and fitness for purpose

03 Maintenance

04 Life expectancy and the environment

05 Safety

I CAN…

- ☐ describe how function has influenced a product
- ☐ explain the difference between primary and secondary function
- ☐ describe performance, maintenance and safety features
- ☐ describe how life expectancy affects design, manufacture and the environment
- ☐ give a different, specific example for each factor

COURSE SPECIFICATION

DEVELOPING IDEAS influence of function; primary and secondary function

K&U performance; maintenance; life expectancy; fitness-for-purpose; safety

ASSIGNMENT applying K&U of design — 4 marks

IN THE EXAM

A pictured product with linked parts: "Describe how function / safety may have influenced the design of the…" (2–4 marks each). Life expectancy questions (2–3) appear in both sections.

IN THE ASSIGNMENT

Developing ideas — design knowledge (4 marks). Top band needs design knowledge applied to the key points from your brief — all the way through, not just at the start.

Brief | Research | Spec | Ideas | Develop | Models | Graphics | Plan | Evaluate

4.1 Function

The **function** of a product is what it does — the job it is designed to perform. Function influences almost every design decision: the parts a product has, their size, shape, materials and how they move.

PRIMARY FUNCTION

The main job

A kettle **boils water**. A phone stand **holds a phone**. Without this, the product has no reason to exist.

SECONDARY FUNCTIONS

Extra jobs

A kettle also **shows the water level**, **switches off automatically** and **stores its cable**. They add value but aren't the main purpose.



Fig. 4.1 Kettle: the primary function is to boil water; the window, switch and cordless base are secondary functions.

When an exam question asks how function has influenced a product, describe a **specific part** and **what it does** for the user.

WHAT SCORES

Describe how function influenced the bicycle

1 MARK	*"Brakes can be used to control the speed of the bicycle."*
2 MARKS	*"It has a basket and a rack at the rear for holding bags."*
0 MARKS	*"It's got brakes."*
0 MARKS	*"It's got a basket."*

WHAT SCORES

Describe how function influenced the gaming chair

1 MARK	*"The gaming chair has wheels so the user can move it."*
1 MARK	*"The back can be changed to a different angle."*
0 MARKS	*"The back can move."*
0 MARKS	*"It is easy to move around."*

EXAM FOCUS

The formula: part + what it does

"To gain marks, candidates must give more than a list of … parts." Name the part **and** its effect. Ergonomic points can count under function only if they are about a specific functional part — and you can't repeat an answer you gave in another part of the question.

4.2 Performance

Performance is **how well** a product does its job. Two kettles both boil water, but one may be faster, quieter or easier to pour. Performance covers how well the product works, how long it lasts, how easy it is to look after and whether it withstands misuse.

WHAT SCORES

Performance — child's camera

"Basic responses regarding function that do not indicate how well the product does its job score zero marks."

1 MARK	*"The flash should be bright so that you can take photos in the dark."*
1 MARK	*"The batteries should be easy to change."*
0 MARKS	*"The flash should be bright."*
0 MARKS	*"It should work well."*

4.3 Fitness for purpose

A product is **fit for purpose** if it does the job it was designed for, for its intended users, in the place it will be used. It brings design factors together: the right materials, a suitable size, durability, aesthetics that suit the target market and any standards it must meet.

WHAT SCORES

Fitness for purpose — outdoor play tent

1 MARK	*"They would need to make sure the children can fit in the doorways and tunnel."*
2 MARKS	*"They should have waterproof materials and be the right size for children."*
0 MARKS	*"They are durable."*

4.4 Maintenance

Maintenance is the work needed to keep a product working well and looking good: cleaning, tightening, lubricating, replacing worn parts or batteries. Designers make maintenance easier by:

- choosing materials and finishes that are **easy to clean** (smooth, wipe-clean, removable covers)
- using **standard fixings and components** that can be tightened or replaced
- giving easy **access** to parts that need attention, such as battery covers and filters
- reducing the number of parts that can wear or work loose

WHAT SCORES

Outline one maintenance issue — child's activity toy

1 MARK	*"The activity toy is made from laminated wood so it is easy to clean."*
1 MARK	*"Fixings should be standard sizes should they need replaced."*
0 MARKS	*"It must be easy to maintain."*

4.5 Life expectancy

Life expectancy is how long a product is expected to last before it is replaced. A designer decides this early, because it affects:

AFFECTS…	LONGER LIFE EXPECTANCY MEANS…
Design	durable materials, protective finishes, replaceable parts, standard components, easy to maintain and repair
Manufacture	higher-quality materials and assembly; quality control; often higher cost
Environment	fewer products thrown away, less landfill and fewer resources used — but at end of life it should still be easy to take apart, reuse or recycle

WHAT SCORES

How a designer could extend life expectancy

1 MARK *"Use standard components so that they can be easily replaced if they break."*

1 MARK *"Use materials that are durable against wear and tear."*

0 MARKS *"Make it last longer."*

EXAM FOCUS

Designer, not manufacturer

2025: asked how a **designer** could make products more sustainable, many candidates described what a **manufacturer** could do and lost marks. Read who the question is about. Designer methods: recyclable or fewer materials, fewer parts, design for disassembly, label parts, reuse, longer lifespan.

4.6 Safety

SAFETY ISSUE	DESIGN RESPONSE
Tipping over	Wide base, low centre of gravity, non-slip feet
Cuts	Rounded edges and corners; deburred metal
Trapped fingers	Clearance around hinges and moving parts
Choking (young children)	No small parts that could detach
Poisoning	Non-toxic finishes on toys and food items
Burns / electric shock	Insulated handles, heat-resistant materials, warning lights
Being unseen	Reflectors, lights, bright colours (e.g. bicycles)
Accidents in use	Emergency stop, safety clip, guards, locks

Designers must consider how a product could harm the user or others — in normal use **and** in foreseeable misuse. Many products must meet British Standards.

WHAT SCORES

Safety — treadmill

2 MARKS *"It's got an emergency stop and a safety clip which can be attached to the user."*

1 MARK *"The compartments allow the user to keep their water and phone safe whilst running."*

0 MARKS *"It has compartments."*

04 Questions & activities.

TOPIC 04 · FUNCTION & PERFORMANCE

ACTIVITY 4.1 Function audit

Choose a product at home. List its parts, decide whether each provides a primary or secondary function, and describe what it does for the user.

Product: _____

PART	PRIMARY / SECONDARY	WHAT IT DOES FOR THE USER

ACTIVITY 4.2 Safety detective — toddler high chair

A high chair holds a toddler at a dining table. Identify four hazards and a design response for each.

#	HAZARD	DESIGN RESPONSE
1		
2		
3		
4		

ACTIVITY 4.3 Life expectancy

Compare a disposable plastic razor with a refillable metal razor.

	DISPOSABLE PLASTIC	REFILLABLE METAL
Design		
Manufacture		
Environment		

EXAM PRACTICE

Exam-style questions

8 MARKS

1 A desk lamp is shown below. **You must give different examples in (a), (b) and (c).**



(a) Describe how function may have influenced the design of the lamp. **3**

(b) Describe how safety may have influenced the design of the lamp. **2**

(c) Outline **one** maintenance issue that would have been considered. **1**

(d) Describe **two** ways the designer could extend the life expectancy of the lamp. **2**

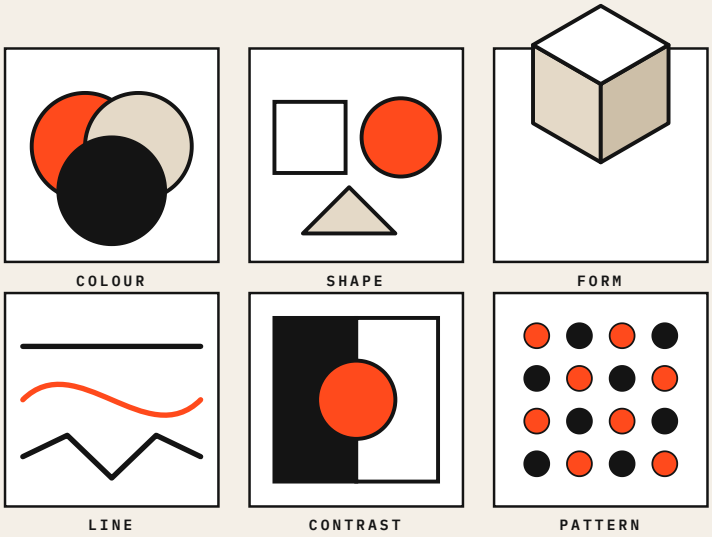
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I can describe performance, maintenance and safety features			
I can describe how life expectancy affects design, manufacture and the environment			
I can give a different, specific example for each factor			

05



TOPIC 05 · DESIGN

Market & aesthetics.

Products have to be wanted before they are bought. Who they are for, how they are sold and how they look all shape the design.

IN THIS TOPIC

01 Target market

02 Marketing techniques

03 The benefits of branding

04 Technology push and market pull

05 Aesthetics — and what influences them

I CAN…

- ☐ describe how the target market influences a design
- ☐ name marketing techniques used to influence sales
- ☐ describe the benefits of a strong brand image
- ☐ describe technology push and market pull
- ☐ describe and compare the aesthetics of products

COURSE SPECIFICATION

DEVELOPING IDEAS influence of the target market

K&U marketing techniques; benefits of branding

K&U technology push and market pull

K&U aesthetics and influences on aesthetics

IN THE EXAM

Aesthetics appears every year (3–4 marks, sometimes comparing products). Branding benefits (2), marketing techniques (2) and technology push / market pull (1 each) are common — push/pull caught many candidates out in 2022 and 2026.

IN THE ASSIGNMENT

Aesthetic research must be analysed — "identify specific aesthetic characteristics that will influence their design, for example specific colours or imagery."

5.1 Target market

The **target market** is the group of people a product is designed and sold for. It might be defined by age, lifestyle, interests, income or needs. A product designed for everyone often suits no-one well, so designers research their target market and design for it.

The target market influences **function** (what features users need), **ergonomics** (their sizes and abilities), **aesthetics** (what appeals to them) and **price**. A small part of a market with very specific needs is a **niche market**.

WHAT SCORES

Target market — two backpacks

1 MARK	*"Backpack A is large because hill walkers need to carry lots of equipment."*
1 MARK	*"The bright colours used appeal to children."*
0 MARKS	*"Backpack B is small."*
0 MARKS	*"The colours are bright."*

5.2 Marketing techniques

Marketing is everything a company does to promote a product and influence people to buy it.

TECHNIQUE	EXAMPLE
Advertising	TV, radio, billboards, leaflets
Online / social media	websites, apps, influencer posts
Celebrity endorsement	a famous person uses the product
Special offers	introductory price, BOGOF, vouchers
Free gifts / prizes	a free case with a phone
Brand name	sell under a recognised name
Store placement	prominent location in shops
Try before you buy	demos, trials, sample products
Reviews	customer ratings, expert reviews

EXAM FOCUS

Count your techniques carefully

Marking instructions: "Multiple references to adverts, e.g. TV/newspaper adverts, can only be awarded one mark." The same applies to several kinds of special offer. Give two **different** techniques.

1 MARK	*"Celebrity endorsement."*
1 MARK	*"Introductory offer."*
1 MARK (TOTAL)	*"TV adverts and radio adverts."*

QUICK CHECK

01 Who is the target market for DOCK?

02 Name two marketing techniques.

03 What is a niche market?

5.3 Branding

A **brand** is the name, logo and identity that customers recognise. A strong **brand image** makes people think of a company in a particular way — for quality, style, value or reliability.

Benefits of a strong brand image

- **Trust** in the brand name and its reputation
- **Customer loyalty** — people buy from the brand again
- **Premium pricing** — people will pay more
- **Self-promoting** — the brand advertises itself
- **Perception of high quality** across all its products
- More **guaranteed sales** when new products launch

WHAT SCORES

Describe two benefits of a strong brand image

1 MARK *"Well known, so people are more likely to buy it."*

1–2 MARKS *"If customers believe the brand produces high quality products, then they are more likely to purchase an additional product from the same brand."*

5.4 Technology push and market pull

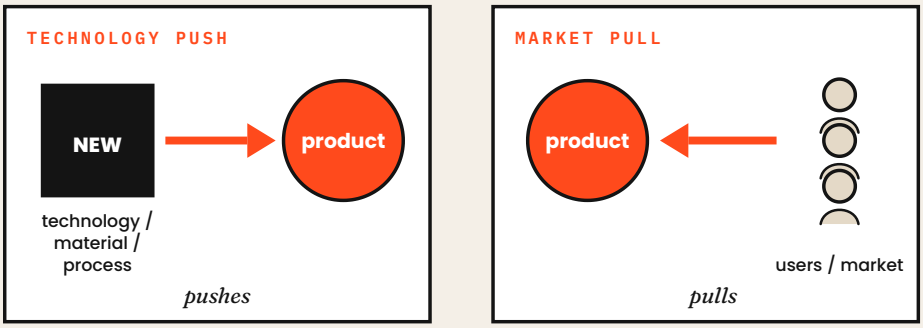


Fig. 5.1 Push starts with a new technology. Pull starts with what people need or want.

Technology push

New products are developed because of **research into new technology, materials or production methods** — not because people asked for them. *Examples*: touchscreens, LED lighting, 3D printers, lithium-ion batteries making cordless tools possible.

WHAT SCORES

Describe what is meant by technology push

1 MARK *"When a new technology is developed it means new products can be designed."*

Market pull

New products are developed **in response to consumer needs, demand or changes in society**. Companies react to what people want. *Examples*: reusable water bottles after concern about plastic waste; bigger phone screens; quieter, energy-efficient appliances.

WHAT SCORES

Describe what is meant by market pull

1 MARK *"Market pull refers to when companies have to come up with new products because consumers want them."*

0 MARKS *"What people want to buy."*

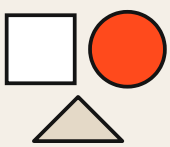
5.5 Aesthetics

Aesthetics is how a product appeals to the senses — mainly how it **looks**, but also how it feels. Designers use a shared vocabulary to describe aesthetics. Use these words accurately, and always link them to a part of the product.



Colour

Hue, brightness, warm or cool; primary, contrasting or harmonising colours.



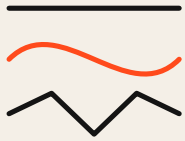
Shape

2D outline: geometric (squares, circles) or organic (flowing, natural).



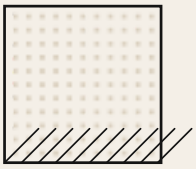
Form

The 3D shape — solid, hollow, chunky, slim.



Line

Straight, curved, flowing, angular edges and details.



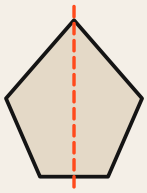
Texture

How a surface feels or looks: smooth, ribbed, matt, gloss, soft.



Proportion

The size of parts compared with each other and the whole.



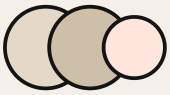
Symmetry

Mirror image about a centre line — or deliberately asymmetrical.



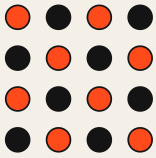
Contrast

Difference between colours, shapes, textures or materials.



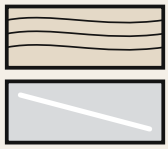
Harmony

Parts that look like they belong together — similar colours or shapes.



Pattern

A repeated shape, line or colour: stripes, dots, checks.



Material

The look of the material: wood grain, brushed metal, clear acrylic.



Style / fashion / theme

Retro, modern, minimalist, a trend or a theme.

5.6 Influences on aesthetics

INFLUENCE	HOW IT AFFECTS AESTHETICS
Target market	Bright primary colours for young children; muted, refined finishes for adults
Fashion and trends	Popular colours, finishes and styles change over time
Theme or culture	A brief theme (e.g. retro) gives colours, shapes and imagery to use
Function	Form often follows the job — a handle shape, a pouring spout
Materials and processes	Wood grain, moulded curves, laser-cut patterns
Brand identity	Products in a range share colours, logos and details

5.7 Describing aesthetics

To earn a mark, name an aesthetic area **and** link it to a part of the product. A **contrast** point always refers to two aspects, so it can earn 2 marks.

WHAT SCORES

Describe the aesthetic aspects of the water bottle

- 1 MARK — *"The bottle has a curved shape."*
- 2 MARKS — *"The pink and black parts of the bottle contrast."*
- 0 MARKS — *"Colourful."*
- 0 MARKS — *"It looks good."*
- 0 MARKS — *"Colour, shape, texture. (a list)"*

5.8 Comparing aesthetics



Fig. 5.2 Lamp A



Fig. 5.3 Lamp B

When a question asks how products **compare**, every point must mention **both** products. In 2023 many candidates "used the correct terminology to describe aesthetics" but "did not compare" — and lost marks.

WHAT SCORES

Compare the lamps aesthetically

- 1 MARK — *"Lamp A has straight, angular arms while Lamp B has a single curved arm."*
- 2 MARKS — *"The bright orange shade of Lamp A contrasts with the pale sand dome of Lamp B."*
- 0 MARKS — *"Lamp A is modern. (no comparison)"*

TOPIC IN 30 SECONDS

- Target market shapes function, ergonomics, aesthetics and price.
- Branding: trust, loyalty, premium pricing, self-promotion, quality, sales.
- Push = new technology drives new products. Pull = consumer demand drives new products.
- Aesthetic answers: term + part. Compare = mention both products.

EXAM FOCUS

Words that score zero

"Eye-catching" on its own, "colourful", "nice", "different", "interesting" and "unusual" are too vague. Opinions such as "it looks good" are specification-type statements and score 0.

05 Questions & activities.

TOPIC 05 · MARKET & AESTHETICS

ACTIVITY 5.1 One product, three markets

Describe how a water bottle would be designed differently for each target market.

	FUNCTION	AESTHETICS	PRICE
Toddler			
Marathon runner			
Office worker			

ACTIVITY 5.2 Aesthetic word bank



Describe the bottle using four **different** aesthetic terms. Link each one to a part.

ACTIVITY 5.3 Push or pull in your life

A product created by **technology push**. Explain how.

A product created by **market pull**. Explain how.

EXAM PRACTICE

Exam-style questions

8 MARKS

1 An office chair is shown below.



(a) Describe **three** aesthetic aspects of the chair. **3**

(b) Describe how the target market of office workers may have influenced the design of the chair. **2**

(c) Outline **two** marketing techniques that could be used to launch the chair. **2**

(d) Explain **one** benefit to a company of selling the chair under a well-known brand name. **1**

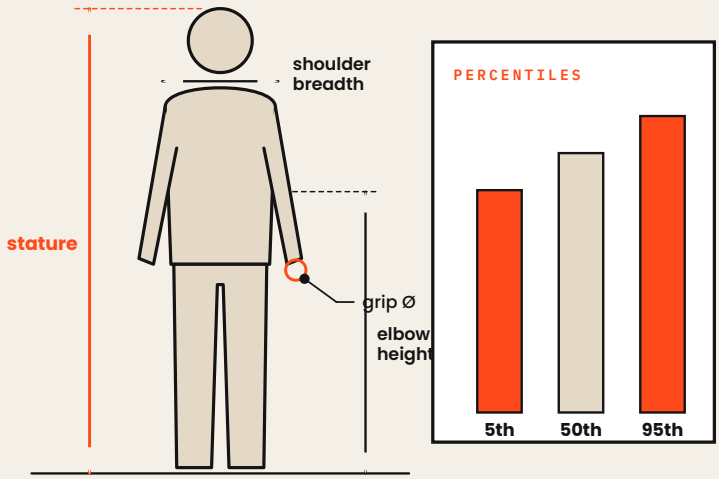
CHECK YOURSELF

How confident am I?

TICK OR TYPE X

SUCCESS CRITERIA	NOT YET	NEARLY	GOT IT
I can describe how the target market influences a design			
I can name marketing techniques used to influence sales			
I can describe the benefits of a strong brand image			
I can describe technology push and market pull			
I can describe and compare the aesthetics of products			

06



TOPIC 06 · DESIGN

Ergonomics & anthropometrics.

Products are used by people of every shape and size. Ergonomics makes sure they are safe, comfortable and easy to use — for as many of those people as possible.

IN THIS TOPIC

01 What ergonomics means

02 Anthropometrics, physiology and psychology

03 Anthropometric data and percentiles

04 Designing for a range of users

05 The 4-mark ergonomics question

I CAN…

- ☐ describe how ergonomics has influenced a product
- ☐ link a product part to a body measurement
- ☐ explain what percentiles are
- ☐ choose the right percentile for a design problem
- ☐ avoid answers that score zero

COURSE SPECIFICATION

DEVELOPING IDEAS influence of ergonomics: safety, comfort, ease of use

K&U the use of anthropometric data

ASSIGNMENT research, specification and refinement of sizes

IN THE EXAM

Every paper since 2018 has a 4-mark "Describe how ergonomics may have influenced the design of the…" question. Course reports say many candidates stall at 2 marks.

IN THE ASSIGNMENT

Anthropometric data from the data booklet gives research-based sizes for your specification and refinement. Models let you test ergonomics.

6.1 What is ergonomics?

Ergonomics is the study of how people interact with products and their surroundings. Designers apply it so that products are **safe**, **comfortable** and **easy to use**. It has three parts:

- **Anthropometrics** — measurements of the human body (heights, reaches, hand and head sizes) used to size products.
- **Physiology** — how the body works: strength, movement, posture, comfort and fatigue.
- **Psychology** — how our senses and mind respond: colours, sounds, lights, textures and controls that are easy to understand.

You don't have to name which area you are using in an exam answer — and mixing them up is not penalised. What matters is the **link** between a part and a person.

KEY TERMS

Ergonomics
Designing products to suit people so they are safe, comfortable and easy to use.

Anthropometric data
Tables of body measurements for groups of people.

Percentile
The percentage of people who are the same size as, or smaller than, a measurement.

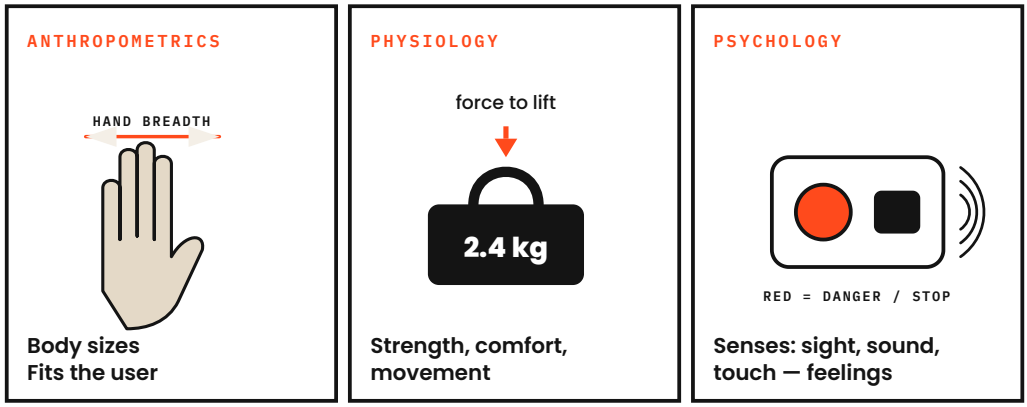


Fig. 6.1 The three areas of ergonomics.

One product, six ergonomic links

AREA	KETTLE PART	ERGONOMIC LINK
Anthropometrics	Handle length	must suit the width of the hand (palm width)
Anthropometrics	Switch	sized for the thumb or finger
Physiology	Body when full	light enough to lift and pour with one hand
Physiology	Switch	needs only a light force to press
Psychology	Water window	easy to see the water level
Psychology	Switch light / click	shows the kettle is on and when it has boiled



Fig. 6.2 Kettle

Brief | Research | Spec | Ideas | Develop | Models | Graphics | Plan | Evaluate

6.2 Anthropometric data and percentiles

People vary in size. **Anthropometric data** records body measurements for large groups of people — sorted by age and sex — so designers can size products using real data instead of guesses.

Data is given as **percentiles**. The **5th percentile** value is the size that only 5% of people are smaller than; the **95th percentile** value is the size that 95% of people are smaller than. Designing between the 5th and 95th percentiles suits **90% of users**.

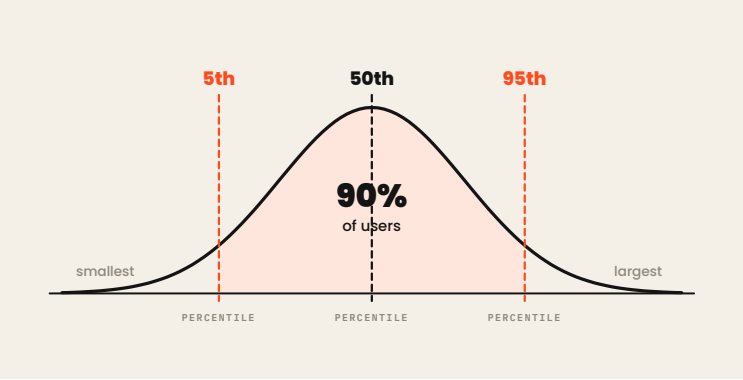


Fig. 6.3 Most designs aim to suit the middle 90% of the target market.

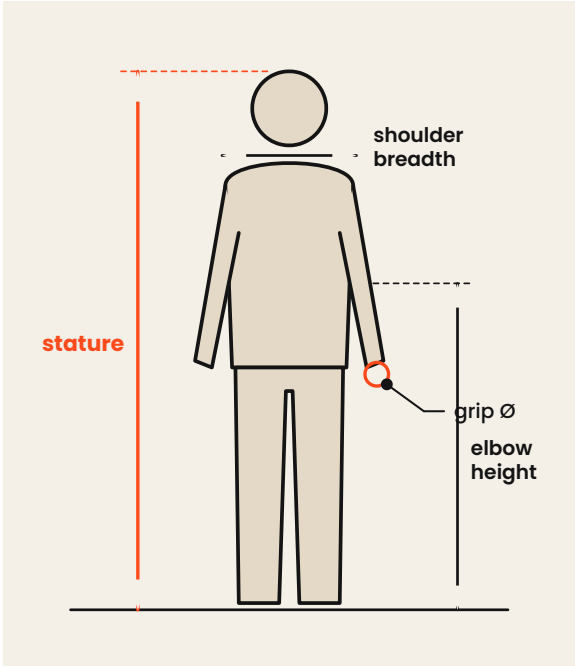


Fig. 6.4 Common anthropometric measurements.

Choosing the right percentile

DESIGN PROBLEM	USE…	BECAUSE…
Clearance — doorway, legroom, a handle gap	**95th** percentile	if the largest users fit, smaller users will too
Reach — a shelf, a switch, a pedal	**5th** percentile	if the smallest users can reach, larger users can too
Strength — force to open, lift or turn	the **weaker** user	everyone else will manage easily
A range of users — seat height, desk, bike	**adjustable** 5th → 95th	one size can't fit everyone, so let users adjust it

DATA BOOKLET

The Design and Manufacture data booklet contains anthropometric tables (5th, 50th and 95th percentiles for adults, 4-year-old children and 16-year-olds, plus hand and head sizes). Use it in your assignment research to give your specification **research-based sizes**.

DOCK

The stand must let a phone be lifted out with one hand, so the gap at each side of the phone is set from **finger widths measured** on a sample of users. The screen angle comes from a **user trip** lying in bed and testing card models at 55°, 65° and 75°.

6.3 The 4-mark ergonomics question

Since 2018 every paper has included a pictured product and the question *"Describe how ergonomics may have influenced the design of the…"* for 4 marks. Each mark needs **one specific part** of the product linked to **one human factor**.

THE FORMULA

[specific part] + [sized for / easy to / tells the user] + [body measurement, strength or sense]

"The diameter of the handle grip fits the grip size of the user's hand."

USE…	FOR EXAMPLE
body part sizes	hand width, finger/thumb size, grip diameter, foot width, stride length, hip width
strength / effort	force to press, turn, lift, fold, pull, push
comfort	soft grips, padding, posture
senses	colour-coded parts, warning lights, clicks and beeps, clear symbols

WHAT SCORES

Describe how ergonomics influenced the kettle

1 MARK *"The length of the handle must be the correct size for the width of the hand."*

1 MARK *"The size of the buttons must relate to thumb/finger size."*

0 MARKS *"The length of the handle has to be the correct size to be lifted by everyone."*

0 MARKS *"95th percentile. (percentile only)"*

WHAT SCORES

Gaming wheel and pedals

1 MARK *"The pedals should fit the width of the user's foot."*

1 MARK *"The shape of the wheel is like a real race car, so will make the user feel like they are really racing."*

0 MARKS *"Gaming wheel fits user's sizes."*

EXAM FOCUS

Why candidates stall at 2 marks

2026: "many candidates could not formulate responses to gain the final 2 marks." Plan four **different parts** before you write. Aesthetic comments ("the blue cover looks attractive") are not psychology and score 0.

DESIGN ASSIGNMENT DEVELOPING IDEAS

DESIGN K&U · 4 MARKS

Ergonomics is design knowledge. Use anthropometric data to **set sizes**, test them with a scale or full-size model, record what you find, and show how the final sizes meet your specification. Don't just write "it is ergonomic".

TOPIC IN 30 SECONDS

- Ergonomics = safe, comfortable, easy to use.
- Anthropometrics (sizes) · physiology (strength, comfort) · psychology (senses).
- 5th–95th percentile suits 90%: clearance → 95th, reach → 5th, range → adjustable.
- Exam: one part + one human factor per mark. Never percentiles alone.

QUICK CHECK

01 Which percentile would you use for a doorway height? Why?

02 Give two ergonomic links for a computer mouse.

06 Questions & activities.

TOPIC 06 · ERGONOMICS

ACTIVITY 6.1 Measure up

Measure the hand breadth and hand length of five people in mm. Compare your results with the adult data in the data booklet.

PERSON	HAND BREADTH (MM)	HAND LENGTH (MM)
1		
2		
3		
4		
5		

Data booklet, adult female: hand breadth 70 / 80 / 90 mm, hand length 160 / 175 / 190 mm (5th / 50th / 95th). Adult male: hand breadth 80 / 90 / 100 mm, hand length 170 / 190 / 210 mm. How do your results compare?

ACTIVITY 6.2 Size the café holder

Choose the percentile and the user group you would use, and explain why.

DESIGN DECISION	PERCENTILE + USER GROUP	WHY?
Gap between bottles so fingers fit		
Distance customers must reach across a table		
Force needed to lift the holder off a clamp		

ACTIVITY 6.3 Ergonomic links

For the desk lamp in Topic 04, write one link for each area of ergonomics.

ANTHROPOMETRICS

PHYSIOLOGY

PSYCHOLOGY

EXAM PRACTICE

Exam-style questions

8 MARKS

1 A sports water bottle is shown below.



(a) Describe how ergonomics may have influenced the design of the bottle. **4**

(b) Explain why designers use anthropometric data. **2**

(c) State which percentile would be used for the length of a bed. Explain your answer. **2**

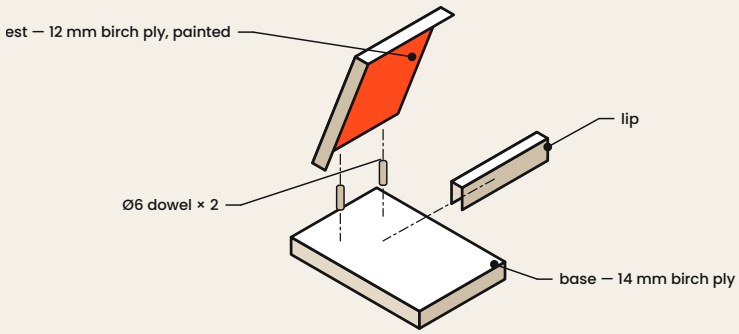
CHECK YOURSELF

How confident am I?

TICK OR TYPE X

SUCCESS CRITERIA	NOT YET	NEARLY	GOT IT
I can describe how ergonomics has influenced a product			
I can link a product part to a body measurement			
I can explain what percentiles are			
I can choose the right percentile for a design problem			
I can avoid answers that score zero			

07



TOPIC 07 · DESIGN

Modelling & graphics.

Models and drawings are how designers think, test and communicate. Choosing the right one at the right moment is a design skill in itself.

IN THIS TOPIC

01 Why designers use models

02 Sketch, block, scale and computer models

03 Why designers use graphics

04 Choosing a graphic technique

05 Models and graphics in the assignment

I CAN…

- ☐ explain why models are used in the design process
- ☐ give reasons for choosing a type of model
- ☐ give reasons for choosing a type of graphic
- ☐ describe what an exploded view, working drawing or rendered pictorial shows
- ☐ use models and graphics for a purpose

COURSE SPECIFICATION

USE OF MODELLING generate and explore; test and refine; communicate

K&U advantages of modelling; reasons for selection of sketch, scale, block and computer-generated models

USE OF GRAPHICS use; advantages; reasons for selection of graphic techniques

IN THE EXAM

Two or three 2-mark questions most years: reasons for sketching, working drawings, exploded views, rendered pictorials, or the benefits of sketch, block and scale models.

IN THE ASSIGNMENT

Using models — 6 marks and **using graphics — 6 marks**. Models must have a purpose and a recorded outcome; graphics must suit the stage of the design process.

7.1 Why use models?

A **model** is a 3D representation of an idea. Models let designers — and users — see, hold and test a design before it is made for real. The course specification describes three uses:

01
Generate & explore
Quick models to try out shapes and ideas in 3D.

02
Test & refine
Check sizes, ergonomics, stability, mechanisms, proportion.

03
Communicate
Show a client, team or user what the design will be like.

WHAT SCORES

Explain why models are used (3 marks)

- 1 MARK — *"To check the sizes."*
- 1 MARK — *"To help generate ideas."*
- 1 MARK — *"To communicate the design to the client."*
- 0 MARKS — *"To check it. (too vague)"*
- 0 MARKS — *"To see what it looks like."*

Advantages of modelling

- gives a better understanding of the **3D form** than a drawing
- lets users **interact** with the design and give feedback on ergonomics
- problems are found and fixed **before** manufacture, when changes are cheap
- can be altered and refined as feedback is gained
- cheaper than making the real product repeatedly

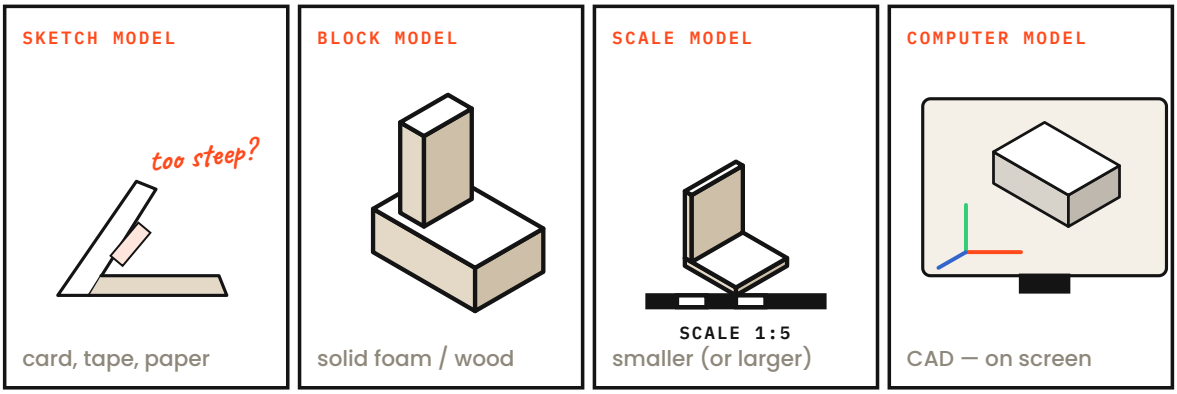


Fig. 7.1 The four types of model named in the course specification.

7.2 Choosing a type of model

Different models suit different stages and purposes. The course specification asks for **reasons for selection** of sketch, scale, block and computer-generated models.

MODEL	WHAT IT IS	CHOOSE IT TO…	EXAM-CREDITED REASONS
Sketch model	Rough, quick model in paper, card, tape, wire or clay	generate and explore ideas in 3D at the start	produced quickly so lots can be made · low-cost, easy-to-find materials · needs little skill · forms hard to sketch · get early feedback
Block model	Solid block of foam or wood shaped to the outside form	check form, proportion, ergonomics and aesthetics	feedback on ergonomics by holding it · check size and position of buttons · evaluate aesthetics · present to a client
Scale model	Accurate model smaller (or larger) than real life	test proportion, fit in a location and mechanisms when full size is impractical	test proportion of parts · explore different sizes · check it fits its location · range of movement of parts
Computer-generated model	3D CAD model	refine details, check fit and present realistically	easy to edit · view from any angle · realistic materials and colours · share electronically · export to CAM / 3D printing

WHAT SCORES

Benefits of sketch models

1 MARK *"Quicker to make than scale models."*

1 MARK *"A rough idea of what it looks like."*

1 MARK *"The designer gets to see their ideas in 3D form."*

0 MARKS *"Cheap. (unqualified)"*

WHAT SCORES

Information from a block model of a toaster

1 MARK *"The size of the push levers can be checked to ensure they fit the size of fingers."*

1 MARK *"The proportion compared to other kitchen items."*

0 MARKS *"To test it."*

Modelling materials

Paper and card — cut, fold and tape quickly · **corrugated card** — stiff, joins easily with masking tape · **styrofoam / blue foam** — carved and sanded to smooth forms · **clay / modelling compound** — shaped by hand into organic forms · **balsa and MDF** — accurate scale parts · **wire** — frames and mechanisms · **3D printing** — accurate parts from CAD.

EXAM FOCUS

Physical ≠ computer

If a question asks about **physical** models, references to computer-generated models score 0 — and reasons such as "easy to share electronically" only count when the question is about CAD.

7.3 Why use graphics?

Graphics are used throughout the design process to **generate and explore** ideas, **test and refine** them, and **communicate** the proposal. Early graphics are fast and rough; later graphics are accurate and detailed. Choose the graphic type that suits the job.

GRAPHIC	USED TO…	EXAM-CREDITED REASONS
Thumbnail / initial sketches	generate lots of ideas quickly	produced quickly so many ideas in a short time · communicate ideas visually · easy to change or discard · no specialist equipment · not limited by software
Annotated sketches	explore and explain ideas	notes add information about materials, sizes, functions and decisions
Exploded view	show how parts fit together	how parts align and join · joining methods · individual parts · number of parts
Working drawing (orthographic, dimensioned)	plan for manufacture	dimensions · how parts join · part names and numbers · materials · orthographic views · scaled-up details
Rendered pictorial / CG image	communicate the final look	shows aesthetic qualities — colour, texture, pattern, proportion · shows materials · present to a client · use in marketing

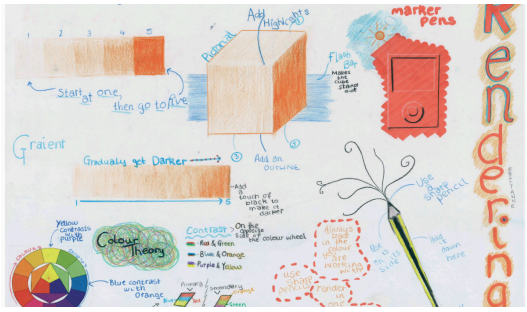


Fig. 7.2 Annotated sketches and manual rendering.

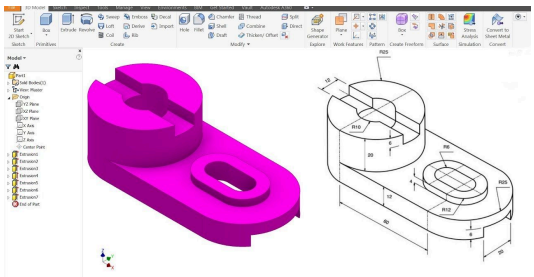


Fig. 7.3 A CAD model and the working drawing generated from it.

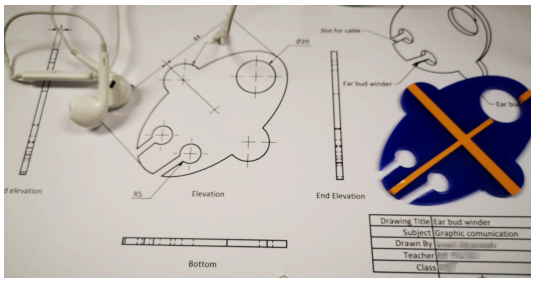


Fig. 7.4 Working drawing alongside the finished product.

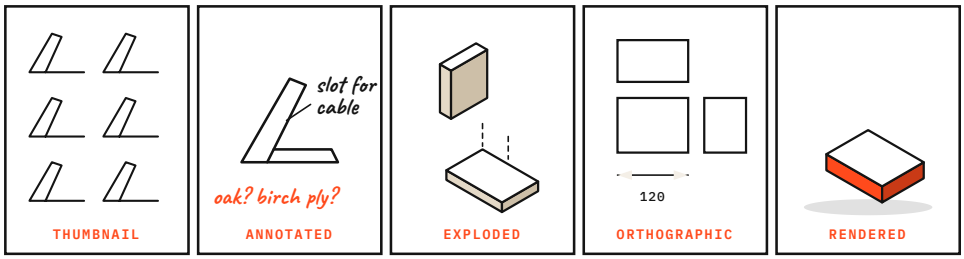


Fig. 7.5 Graphics get more detailed as the design develops.

EXAM FOCUS

Be specific to the graphic

2024: candidates "referenced generic reasons for the use of graphics without specifically considering a rendered pictorial." 2023: "Many candidates only outlined one reason" for working drawings. Give two **different** reasons that only make sense for **that** technique.

7.4 One product, three graphics

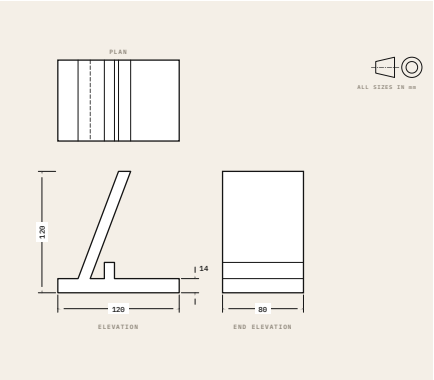


Fig. 7.6 Working drawing — sizes for manufacture.

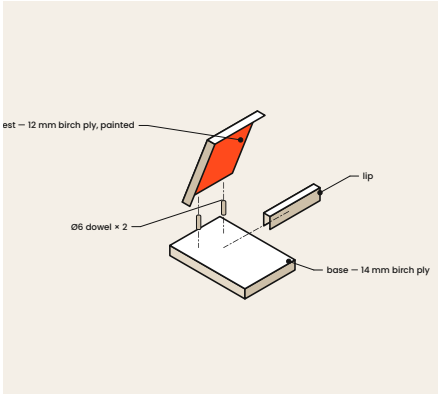


Fig. 7.7 Exploded view — how parts fit together.

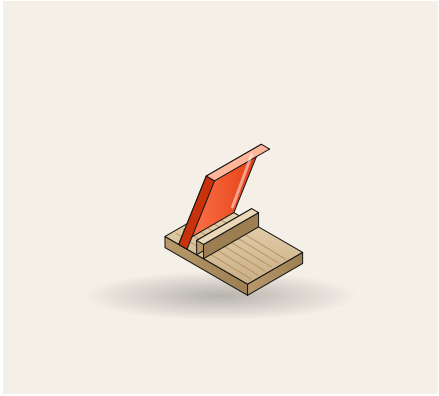


Fig. 7.8 Rendered pictorial — the final look.

WHAT SCORES

Working drawings

1 MARK *"To show the sizes of the parts."*

1 MARK *"To show how the parts go together."*

0 MARKS *"To see what it looks like."*

0 MARKS *"To show the client."*

WHAT SCORES

Exploded view

1 MARK *"You can see how it fits together."*

1 MARK *"Joining methods can be clearly shown."*

0 MARKS *"Quick and easy."*

WHAT SCORES

Rendered pictorial

1 MARK *"You can see the colours and patterns."*

1 MARK *"Used to communicate what materials the product is made from."*

0 MARKS *"To know what it will look like."*

7.5 Models and graphics in the assignment

MARKS	USING MODELS (6)	USING GRAPHICS (6)
1–2	limited use of modelling to generate ideas, test and evaluate, resolve issues and communicate	limited use of graphics to communicate ideas, explore and refine, and communicate details
3–4	adequate use…	adequate use…
5–6	effective use of modelling to generate ideas, test and evaluate, resolve issues and communicate the proposal	effective use of graphics… "it is likely that a range of graphic types will have been used"

DESIGN ASSIGNMENT MODELS · GRAPHICS

6 + 6 MARKS

- "Modelling must be used for a purpose." Say why you made it and record what you found.
- "A model used solely for presentation will not allow candidates to achieve marks above the bottom band."
- Marks are for the **use** of models and graphics, not their quality.
- Scale models used to refine dimensions raised marks in 2025.

07 Questions & activities.

TOPIC 07 · MODELS & GRAPHICS

ACTIVITY 7.1 Make it, test it

Make a quick card sketch model of one of your café holder ideas. Record how you used it.

PURPOSE OF THE MODEL

WHAT I TESTED AND HOW

WHAT I FOUND OUT

CHANGE I WILL MAKE

Sketch your model (or attach a photograph).

ACTIVITY 7.2 Right graphic, right job

Choose the best graphic for each job and give a reason.

JOB	GRAPHIC	REASON
Getting lots of ideas down quickly		
Showing how six parts fit together		
Giving the sizes needed to make it		
Showing a client the final colours and materials		
Explaining a decision about a joint		

EXAM PRACTICE

Exam-style questions

8 MARKS

1 Models and graphics are used throughout the design process.

(a) Describe **two** benefits of using computer-generated models. **2**

(b) Outline **two** reasons for using annotated sketches while developing ideas. **2**

(c) Explain why a scale model may be used when designing a bus shelter. **2**

(d) Name the type of drawing used to show how the parts of a product fit together. **1**

(e) State why a model used only to present a final design gains few marks in the design assignment. **1**

CHECK YOURSELF

How confident am I?

TICK OR TYPE X

SUCCESS CRITERIA	NOT YET	NEARLY	GOT IT
I can explain why models are used in the design process			
I can give reasons for choosing a type of model			
I can give reasons for choosing a type of graphic			
I can describe what an exploded view, working drawing or rendered pictorial shows			
I can use models and graphics for a purpose			

08

SPECIFICATION POINT	MET?
Holds phones up to 80 mm wide	✓
Screen angle 60–70° for viewing in bed	✓
Footprint no larger than 130 × 90 mm	✓
Cable can pass through for charging	✗ *refine*
Colours suit a teenage bedroom	✓

TOPIC 08 · DESIGN

Evaluation & refining.

Evaluation is not a last page. Designers judge their work at every stage, and every judgement drives the next improvement — until the proposal is ready to make.

IN THIS TOPIC

01 Evaluation in the design process

02 Methods to evaluate products

03 Evaluating against the specification

04 Exploring and refining ideas

05 Applying knowledge in the assignment

I CAN…

- ☐ describe methods used to evaluate products
- ☐ describe how a user trial is carried out
- ☐ evaluate a design against its specification
- ☐ explore alternatives and justify a decision
- ☐ refine an idea into a proposal that can be made

COURSE SPECIFICATION

EVALUATION evaluate the design proposal

K&U methods to evaluate products: comparison to other products, user trials, comparison against specification, questionnaires

DEVELOPING IDEAS explore and refine ideas towards a proposal

IN THE EXAM

Evaluation is mostly tested indirectly: the specification "as an ongoing evaluation tool", user trips "to evaluate products", block and scale models to evaluate aesthetics and ergonomics.

IN THE ASSIGNMENT

Developing ideas — 20 marks: exploring (6), refining (6), design K&U (4), materials and manufacture K&U (4). Evaluation drives all of it.

8.1 Evaluation in the design process

Evaluation means judging how well something meets its purpose, so you can decide what to keep and what to change. In an iterative design process designers evaluate continually: research findings, ideas, models, the proposal and finally the prototype. Each evaluation leads to a decision — and often a change.

Good evaluation uses **evidence** — a test result, a measurement, a user's feedback, a specification point — not just opinion.

WEAK VS STRONG

✕ *"I think my design is good."*

✓ *"In a user trial, 4 of 5 users lifted the phone out with one hand — the "removed with one hand" specification point is met."*

8.2 Methods to evaluate products

METHOD 01

Comparison against the specification

Check the design, model or prototype against every specification point. Record what is met, what isn't, and what to change.

Use it: Throughout — it is "an ongoing evaluation tool".

METHOD 02

User trial

Hand the product or model to a range of users. They carry out set tasks while you observe, then they report back. Record the results.

Use it: To find out how real users get on with ease of use, comfort and function.

METHOD 03

Comparison to other products

Compare features, price, size, materials and quality against similar products on the market.

Use it: To judge value for money and whether your design is better than what exists.

METHOD 04

Questionnaire

Ask the target market for their opinions on the design, often using rating scales.

Use it: To gather opinions from many people about aesthetics, price or preference.

WHAT SCORES

Describe how a user trial could evaluate a scooter

2 MARKS *"The market researcher could take the scooter outside and test it on different surfaces."*

1 MARK *"Hand out the product to a range of users."*

0 MARKS *"Test it."*

0 MARKS *"Use it."*

WHAT SCORES

Evaluating value for money

From the 2015 N5 marking instructions.

2 MARKS *"Find out the price of other scooters and compare these."*

1 MARK *"Compare the price to other scooters."*

Brief | Research | Spec | Ideas | Develop | **Models** | Graphics | Plan | **Evaluate**

8.3 From idea to proposal: exploring and refining

Exploring ideas

Considering **alternatives** — different ways a part could work, be joined, look or be made — and judging the **opportunities and drawbacks** of each. Exploration should show your idea **evolving**, not just getting more detailed.

Explore: function · assembly and joints · aesthetics · materials · components · ergonomics · finishes.

Refining ideas

Making **decisions** that add the detail needed to manufacture the proposal: **sizes**, **materials**, **joining and assembly methods**, **finishes** and components — and showing how the final design meets each specification point.

Refine: "A proposal that has very little detail will not achieve marks above the bottom band for refinement."

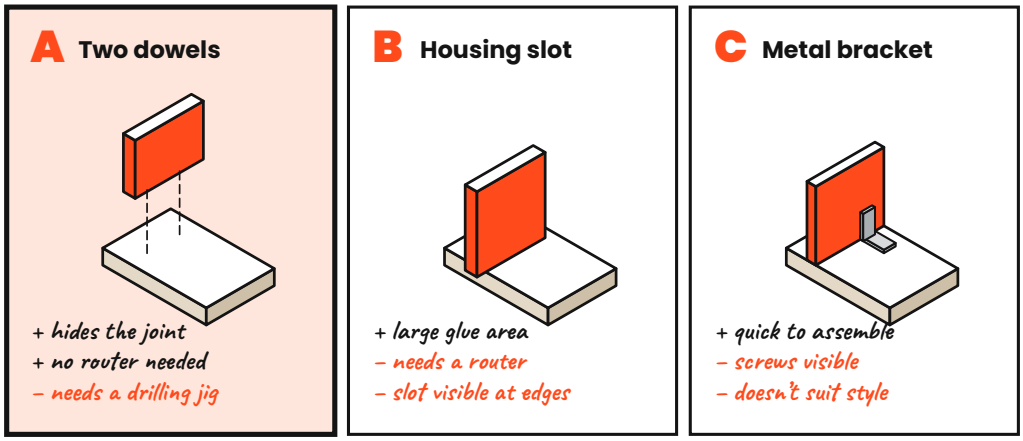


Fig. 8.1 Exploring three ways to join the DOCK back rest to the base — each judged, then a decision is justified.

EXAM FOCUS

Show the decision

"There should be evidence of review and justification of decisions during the development." Write the reason: *"I chose two dowels over a housing slot because they hide the joint and can be drilled accurately with a jig — we don't have a router."*

DESIGN ASSIGNMENT | DEVELOPING IDEAS

EXPLORE 6 · REFINE 6

"Although a proposal that is a detailed version of the original idea may gain marks for refining ideas, it will be unlikely to achieve marks above the bottom band for exploring ideas." Show genuine alternatives.

8.4 Evaluating the proposal against the specification

SPECIFICATION POINT	MET?
Holds phones up to 80 mm wide	✓
Screen angle 60–70° for viewing in bed	✓
Footprint no larger than 130 × 90 mm	✓
Cable can pass through for charging	✗ *refine*
Colours suit a teenage bedroom	✓

Fig. 8.2 A specification check turns evaluation into decisions: anything not met becomes a refinement.

8.5 Applying knowledge in the assignment

Developing ideas is worth **20 of the 55 marks** — the biggest single skill. It is where all your design knowledge from Topics 4–6 and your materials and manufacturing knowledge earn marks, but only when you **apply** it to your design.

DEVELOPING IDEAS (20)	BOTTOM BAND	TOP BAND
Exploring (6)	limited exploration · limited evolution from initial ideas · limited consideration of alternatives	effective exploration · clear evolution from initial ideas · clear consideration of alternatives
Refining (6)	limited refinement · limited detail	effective refinement · effective detail
K&U of design (4)	limited application	effective application — related to the key points from the brief
K&U of materials & manufacture (4)	limited application	effective application

EXAM FOCUS

The number-one weakness in 2025 and 2026

"Most candidates made effective use of their design knowledge when researching their chosen brief and annotating initial ideas. However, only a few candidates continued to explore and refine these areas as they progressed through their assignment." Carry each design factor from your brief and specification through **every** stage.

LABELS VS REASONS

Course reports: candidates made "decisions without reasoning, … simply labelling."

WEAK *"Birch ply."*

STRONG *"Birch ply rather than pine: it is stable and won't split when the dowel holes are drilled, and its pale face suits the matt finish in the specification."*

WEAK *"It is ergonomic."*

STRONG *"The gap beside the phone is sized from the widest finger in our user sample, plus clearance, so the phone can be lifted out with one hand."*

TOPIC IN 30 SECONDS

- Evaluate at every stage, using evidence.
- Methods: compare against the specification, user trials, compare with other products, questionnaires.
- Explore = alternatives + opportunities and drawbacks. Refine = decisions + detail for manufacture.
- Apply design knowledge all the way through — with reasons, not labels.

QUICK CHECK

01 Describe how a user trial is carried out.

02 What is the difference between exploring and refining?

03 Rewrite "Acrylic." as a reasoned decision for a product of your choice.

08 Questions & activities.

TOPIC 08 · EVALUATION

ACTIVITY 8.1 Plan a user trial

Plan a user trial of a café holder prototype.

WHO WILL TEST IT?

WHAT TASKS WILL THEY DO?

WHAT WILL YOU OBSERVE?

HOW WILL YOU RECORD RESULTS?

ACTIVITY 8.2 Evaluate against the specification

Proposal: an oak tray, 300 × 160 mm, with four round holes 60 mm in diameter, a menu slot 5 mm wide, rubber feet, and a rope handle. Mass 0.6 kg. Finished in clear lacquer.

SPECIFICATION POINT	MET?	EVIDENCE / REFINEMENT
Holds bottles up to 70 mm diameter		
Holds an A5 menu card		
Does not move in strong wind		
Uses blue and white from the survey		

ACTIVITY 8.3 Best value?

Three lunch boxes are compared. Decide which is the best value for a secondary pupil and justify your choice.

	BOX A	BOX B	BOX C
Price	£6	£14	£9
Capacity	0.8 litres	1.4 litres	1.2 litres
Features	one compartment	3 compartments, insulated	2 compartments, leak-proof

EXAM PRACTICE

Exam-style questions

8 MARKS

1 Evaluation takes place throughout the design process.

(a) Describe how comparing a proposal against its specification helps a designer. **2**

(b) Describe **two** methods, other than a user trial, that could be used to evaluate a product. **2**

(c) Explain why exploring alternatives is important before refining a design. **2**

(d) Describe **one** decision a designer must make when refining a proposal for manufacture. **2**

CHECK YOURSELF

How confident am I?

TICK OR TYPE X

SUCCESS CRITERIA	NOT YET	NEARLY	GOT IT
I can describe methods used to evaluate products			
I can describe how a user trial is carried out			
I can evaluate a design against its specification			
I can explore alternatives and justify a decision			
I can refine an idea into a proposal that can be made			

The design assignment at a glance.

55 marks. A choice of three briefs. Up to seven A3 sheets, including both pro formas. All sheets are single-sided except the research pro forma.

MARKS	SKILL · EVIDENCE	WHAT THE MARKER LOOKS FOR
8	**Analysing a brief** Research pro forma (both sides)	Research into a range of issues using appropriate techniques; a detailed specification with points gained from research.
9	**Generating ideas** Sketches, photos of sketch models	A large number of creative ideas, clearly different, aimed at the specification.
20	**Developing ideas** Annotated sketches, drawings, model photos	Explore alternatives; refine to manufacturable detail; apply design and materials & manufacture knowledge with reasons.
6	**Using models** Photos at the right places	Purpose stated before making; information recorded; used to generate, test, resolve and communicate.
6	**Using graphics** Sketches and drawings throughout	Graphic types that suit their purpose — rough early, detailed later; a range of types.
6	**Planning for manufacture** Planning pro forma (one side)	Dimensioned sketch or drawing, sequence of operations and cutting list that agree — completed before making.

THE RULES

- Develop a proposal for **one** of the three briefs.
- Maximum **seven A3 sheets** (or equivalent); label each with your name, Scottish Candidate Number and "page x of 7".
- All sheets single-sided except the research pro forma.
- The work must be **your own**. You may use books, notes and the internet.
- **Generative AI is not permitted.**
- You must manufacture your proposal in the practical — so it must let you show your practical skills.

LESSONS FROM THE COURSE REPORTS

- Research must be aimed at your brief — opinions and generic facts score nothing.
- Specification: brief points + a range of research-based points.
- Ideas: clearly different, not copies, not basic shapes.
- Explore with alternatives and say what is good and bad about each.
- Keep using design knowledge through refinement — the main weakness in 2025 and 2026.
- Give reasons for material and manufacturing decisions.
- Every model needs a purpose and a recorded outcome.
- Make the planning pro forma's three parts agree.

Mark allocations and quotations are from the SQA / Qualifications Scotland N5 Design and Manufacture assessment task (valid for session 2024–25 only, November 2024 edition) and course reports 2022–2026. Always check the current documents on the Qualifications Scotland website.

Glossary.

Aesthetics
How a product appeals to the senses, mainly how it looks.

Analysing a brief
Breaking a brief down to find what is needed and what to research.

Anthropometrics
Measurements of the human body used to size products.

Block model
A solid model showing the outside form, used to check proportion and ergonomics.

Brainstorming
A group idea generation technique: lots of ideas, recorded, none too silly.

Brand image
How customers see a company and its products.

Design brief
A short statement of a problem or need.

Design proposal
The final, refined design ready for manufacture.

Ergonomics
Designing products to be safe, comfortable and easy to use.

Evaluation
Judging how well something meets its purpose, using evidence.

Exploded view
A drawing showing parts separated along their assembly lines.

Exploring
Considering alternative solutions and their opportunities and drawbacks.

Fitness for purpose
How well a product does the job intended, for its users and environment.

Function
What a product does. Primary = main job; secondary = extra jobs.

Iterative
Repeating stages to evaluate and improve a design.

Life expectancy
How long a product is designed to last.

Maintenance
Work needed to keep a product working: cleaning, repairing, replacing parts.

Market pull
New products developed because consumers need or want them.

Morphological analysis
A table of parameters and attributes combined to generate ideas.

Percentile
The % of people the same size as or smaller than a measurement.

Performance
How well a product does its job.

Physiology
How the body works: strength, movement, comfort.

Psychology (ergonomics)
How senses and feelings respond: colours, sounds, clear controls.

Refining
Making decisions that add the detail needed for manufacture.

Rendered pictorial
A realistic 3D image showing colour, texture and materials.

Scale model
An accurate model smaller (or larger) than real life.

Sketch model
A quick, rough model in card, paper or similar.

Specification
A detailed list of what the product must do and be.

Target market
The group of people a product is designed and sold for.

Technology push
New products developed because of new technology, materials or processes.

User trial
Other people use the product while the designer observes.

User trip
The designer uses the product themselves, step by step.

Working drawing
A dimensioned drawing with the information needed to make a product.